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| APPLICATION NO.                       | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---------------------------------------|-------------|----------------------|---------------------|------------------|
| 10/723,474                            | 11/26/2003  | Suan Jeung Boon      | 303.601US2          | 7644             |
| 21186                                 | 7590        | 11/02/2005           | EXAMINER            |                  |
| SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH |             |                      |                     | NGUYEN, DILINH P |
| 1600 TCF TOWER                        |             |                      |                     | ART UNIT         |
| 121 SOUTH EIGHT STREET                |             |                      |                     | PAPER NUMBER     |
| MINNEAPOLIS, MN 55402                 |             |                      |                     | 2814             |

DATE MAILED: 11/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |   |   |
|------------------------------|---|---|
| <b>Office Action Summary</b> | <b>Application No.</b>                  | <b>Applicant(s)</b>                               |
|                              | 10/723,474<br>Examiner<br>DiLinh Nguyen | BOON, SUAN JEUNG<br><i>AM</i><br>Art Unit<br>2814 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 26 September 2005.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 19-25 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 19-25 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/26/03, 6/13/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Objections***

Claim 20 is objected to because of the following informalities:

Lines 1-2, claim 20, replace “the first semiconductor” with -- the first semiconductor device --.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 19 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gillespie (U.S. Pat. 5898858) in view of Capote et al. (U.S. Pat. 6121689).

Gillespie discloses an electronic system comprising:

a processor and a memory controller are integrated into a BGA chip package (fig. 3, abstract).

Gillespie does not explicitly disclose the chip package includes an adhesive layer covering the chip and having an array of openings aligned with connection pads and a conductive material substantially filling the array of openings.

However, Capote et al. disclose a flip chip includes:

a first semiconductor device 10 having a first side and a second side, the first side comprising a first array of connection pads 24, the connection pads electrically coupled to circuits on the first semiconductor device;

an adhesive layer 22 covering the first side of the first semiconductor device, the adhesive layer having an array of openings 28 (fig. 6) substantially aligned with one or more connection pads of the first array of connection pads; and

a conductive material 30 substantially filling the array of openings (figs. 3, 6-7, column 7, lines 60 et seq.). Therefore, it would have been obvious to one having ordinary in the art at the time the invention was made to modify the device structure of Gillespie by having an adhesive layer covering the chip and having an array of openings aligned with connection pads and a conductive material substantially filling the array of openings, as taught by Capote et al., in order to provide a flip chip configuration without bending the chip and substrate (abstract).

- Regarding claim 21, Capote et al. disclose that the adhesive layer 22 is comprised of film layer (fig. 3, column 8, lines 12-18).
- Regarding claim 22, Capote et al. disclose that the adhesive layer includes a curable, fluid material (fig. 3, column 8, lines 17-18).
- Regarding claim 23, Capote et al. disclose that the conductive material is solder 30 (fig. 7, column 9, lines 3).
- Regarding claim 24, Capote et al. disclose that the conductive material is cylindrical in shape (fig. 7).

- Regarding claim 25, Capote et al. disclose that the conductive material is sphere-shaped (fig. 3).

3. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gillespie (U.S. Pat. 5898858) in view of Capote et al. (U.S. Pat. 6121689) and further in view of Toyosawa et al. (U.S. Pat. 6337257).

Gillespie and Capote et al. substantially disclose all the limitations as claimed above except for a protective material substantially covering the second side of the semiconductor device.

However, Toyosawa et al. disclose a semiconductor package comprising a second surface 36 of a semiconductor chip 32 are in contact with a protective tape (cover fig., column 12, lines 28-30). Therefore, it would have been obvious to one having ordinary in the art at the time the invention was made to modify the device structure of Capote et al. by having a protective material covering the second side of the semiconductor device, as taught by Toyosawa et al., in order to protect and reinforced the back surface of the semiconductor chip (column 12, lines 28-30).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN



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PRIMARY EXAMINER